IB DIPLOMA PROGRAMME
PROGRAMME DU DIPLÔME DU BI
PROGRAMA DEL DIPLOMA DEL BI

M06/4/DESTE/HP3/ENG/TZ0/XX

22066203

DESIGN TECHNOLOGY
HIGHER LEVEL
PAPER 3

Friday 19 May 2006 (morning)

1 hour 15 minutes

Candidate session number

0	0							

INSTRUCTIONS TO CANDIDATES

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all of the questions from two of the Options in the spaces provided. You may continue your answers on answer sheets. Write your session number on each answer sheet, and attach them to this examination paper and your cover sheet using the tag provided.
- At the end of the examination, indicate the letters of the Options answered in the candidate box on your cover sheet and indicate the number of answer sheets used in the appropriate box on your cover sheet.

0116

Option D — Food technology

D1. An example of a food label for a low fat milk product is shown in **Figure D1**.

Figure D1: Low fat milk product label

Low-Fat Milk

Nutrition Facts
Serving Size 8 fl. oz. (236g)
Servings Per Container 8

Amount Per Serving	
Calories 100	**Calories from Fat** 20
	% Daily Value
Total Fat 2.5g	4%
Saturated Fat 1.5g	8%
Cholesterol 10g	3%
Sodium 130mg	5%
Total Carbohydrate 12g	4%
Dietary Fibre 0g	0%
Sugars 11g	
Protein 8g	

Vitamin A	10%	* Vitamin C	4%
Calcium	30%	* Vitamin D	25%

* Percent Daily Values are based on a 2,000 calorie diet

(a) List **two** types of information, other than that shown in Figure D1, that could be communicated to consumers on a food label. *[2]*

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(b) Explain how increasing health consciousness has resulted in the development of a modified food product. *[3]*

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D2. Describe how the pasteurization of milk increases its shelf life. *[2]*

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D3. List **two** examples of macronutrients listed on the label in Figure D1. *[2]*

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D4. Describe **one** example of how the genetic modification of a specific food product has resulted in enhanced food production. *[2]*

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D5. Discuss **three** factors to consider when using cooking to control bacterial growth. *[9]*

Option E — Computer-aided design, manufacture and production

E1. The perspective CAD image in **Figure E1** was produced by the designers during the preliminary design phase of a condominium project in Abu Dhabi.

Figure E1

(a) List **two** ways in which the relationship between the designer and consumers can be enhanced through using CAD images such as the one in Figure E1. *[2]*

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(b) Discuss **one** criterion an interior designer would use in selecting a CAD software package. *[3]*

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E2. Outline **one** way in which virtual reality could be used by an interior designer to conserve resources. *[2]*

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E3. List **two** possible impacts that might arise for some of the workforce within a company from the introduction of CAD-CAM. *[2]*

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E4. Describe **one** quality a successful worker would need to have in a lean production company. *[2]*

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E5. Discuss **three** reasons for the growth of multi national companies. *[9]*

Option F — Invention, innovation and design

F1. The Zorin bicycle pump is a new design where the pump is hidden within the frame of the seat post **(Figure F2)**. When the seat post is removed the flexible valve connector is pulled out of the tube **(Figure F1)** to connect to the tyre.

Figure F1

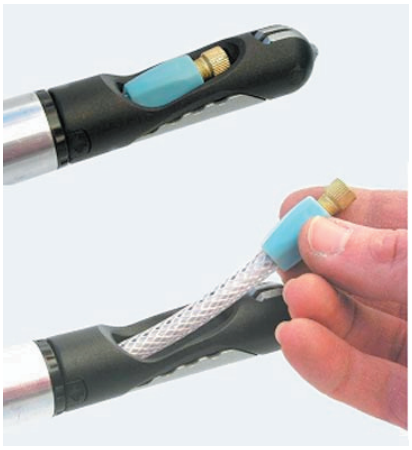

Figure F2

(a) Describe how the seat post bicycle pump in Figure F2 is an example of incremental design. *[2]*

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(b) Explain **one** invention that was important in the development of inflatable tyres for bicycles. *[3]*

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F2. List **two** reasons why market pull may have resulted in the seat post pump. *[2]*

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F3. Compare the lone inventor with the product champion. *[2]*

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F4. Identify **one** way in which the bicycle is an example of a robust design. *[2]*

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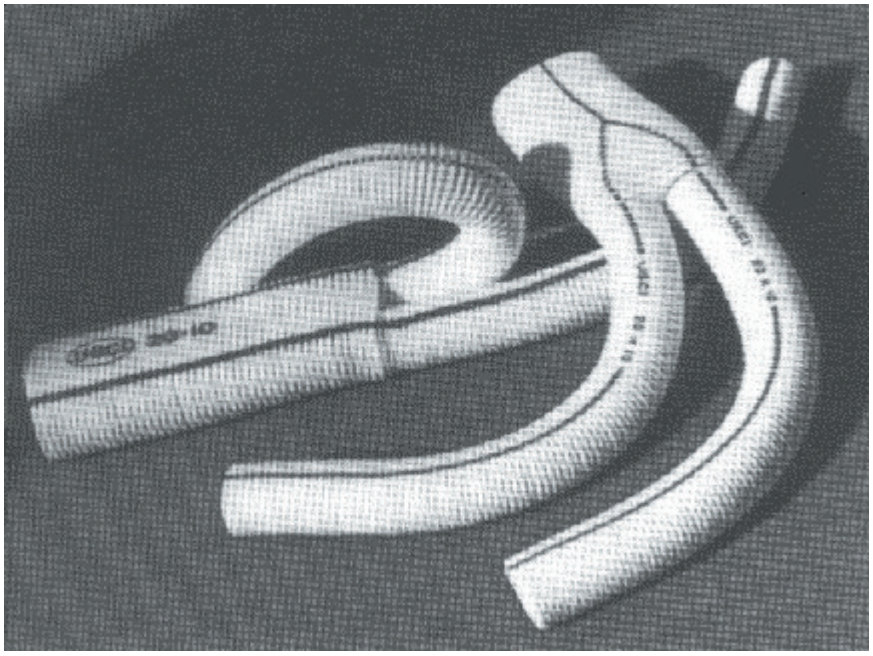
F5. Discuss **three** advantages to the consumer of having the bicycle pump in Figure F1 globally available through the internet. *[9]*

Option G — Health by design

G1. An example of a textile vascular graft, or prosthesis, is shown in **Figure G1**.

Figure G1: Textile Vascular Graft



(a) List **two** criteria for the design of a textile vascular graft such as that in Figure G1. *[2]*

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(b) Discuss **one** difference between vascular prostheses produced by weaving and those produced by knitting. *[3]*

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G2. Describe **one** recent development in the design of textile vascular prostheses. *[2]*

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G3. Outline **one** reason why some metals are commonly used as implant materials. *[2]*

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G4. List **two** reasons for the link between peoples' income and life expectancy. *[2]*

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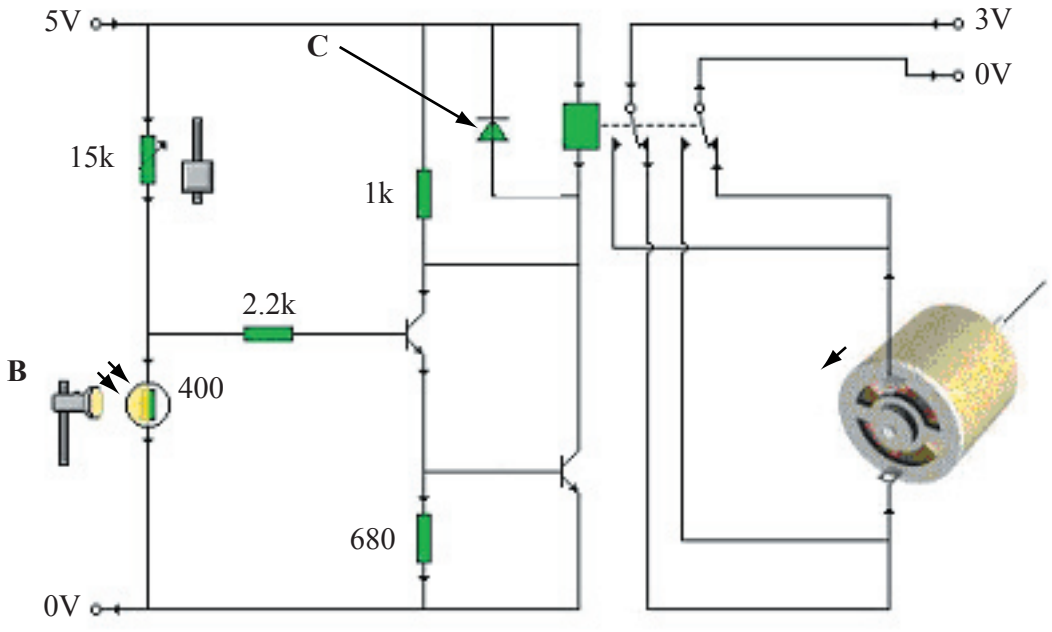
G5. Discuss **three** reasons why investing in ergonomically designed furniture is a sound long term investment for the employer. *[9]*

Option H — Electronic products

H1. The electronic circuit for a control system is shown in **Figure H1**. It has been generated from an electronic CAD package.

Figure H1: Circuit Diagram



(a) Outline a possible use for the circuit in Figure H1. *[2]*

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(b) Explain the function of the component at C in Figure H1. *[3]*

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H2. Describe the function of an Op-amp. *[2]*

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H3. Draw **one** diagram which illustrates the difference between a closed loop and an open loop electronic system. *[2]*

H4. Describe how a telephone and a computer internet connection can share the same cable into a house. *[2]*

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H5. Explain how a contactless smart card works in each of the three areas of: (i) power, (ii) reading and writing, and (iii) memory. *[9]*